

tation was decidedly in excess in the middle and southern slopes of the Rocky Mountains, Missouri, Alberta, and Saskatchewan; it was decidedly deficient in the Lake Region, the Ohio Valley, and the Atlantic and east Gulf States. The largest excesses were: Fort Smith, 11.2; Kansas City, 5.8; Block Island, 5.4; Hannibal, 4.9; Pueblo, 4.7; Jacksonville, 4.6. The principal deficits were: Key West, 3.8; Charlotte and Harrisburg, 3.1; Norfolk, 2.8; Cleveland, Pittsburg, and Alpena, 2.7.

The average departure for each district is also given in Table I. By dividing these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normal exceeds 100): Above the normal: New England, 124; South Atlantic, 105; west Gulf, 155; Ohio Valley and Tennessee, 105; upper Mississippi, 132; Missouri Valley, 117; middle slope, 150; Abilene (southern slope), 284; southern Plateau, 141. Normal: Middle Plateau, 100; Southern Pacific, 100. Below the normal: Middle Atlantic, 75; Florida Peninsula, 80; east Gulf, 71; lower Lake, 83; upper Lake, 50; North Dakota, 96; northern slope, 66; northern Plateau, 60; North Pacific, 82.

The years of greatest and least precipitation are given in the REVIEW for July, 1894. The precipitation for the current month was the greatest on record at Pueblo, Abilene, Topeka, Kansas City, Springfield, Mo., Fort Smith, Chattanooga, Block Island, Nantucket, and Vineyard Haven. It was the least on record at Carson City, Corpus Christi, Green Bay, Alpena, and Harrisburg.

The total accumulated monthly departures from normal-precipitation from the beginning of the year to the end of the current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
<i>Excesses.</i>	<i>Inches.</i>	<i>Perc.</i>	<i>Deficits.</i>	<i>Inches.</i>	<i>Perc.</i>
South Atlantic.....	+ 0.60	102	New England.....	- 3.20	88
North Dakota.....	+ 0.90	107	Middle Atlantic.....	- 2.70	90
Northern slope.....	+ 0.30	103	Florida Peninsula.....	- 2.10	92
Abilene (southern slope)...	+ 4.20	125	East Gulf.....	- 2.00	94
Southern plateau.....	+ 0.90	117	West Gulf.....	- 1.10	96
			Ohio Valley and Tenn....	- 7.10	76
			Lower Lakes.....	- 6.50	67
			Upper Lakes.....	- 5.70	70
			Upper Mississippi.....	- 5.40	75
			Missouri Valley.....	- 3.20	85
			Middle slope.....	- 0.90	94
			Middle plateau.....	- 0.60	92
			Northern plateau.....	- 3.30	70
			North Pacific.....	- 0.50	98
			Middle Pacific.....	- 2.20	89
			South Pacific.....	- 2.20	76

Details as to excessive precipitation are given in Tables XIII and XIV.

The total snowfall at each station is given in Table II.

#### HAIL AND SLEET.

The following are the dates on which hail fell in the respective States:

Arizona, 2, 20, 21. Arkansas, 7, 20. Colorado, 2, 6, 9 to 13, 17, 20, 26, 30. Connecticut, 13, 30. Florida, 29. Georgia, 8. Idaho, 5, 8, 30, 31. Illinois, 7, 8, 14, 16 to 19, 24, 26, 27. Indiana, 15, 18. Iowa, 7, 14, 16, 17, 18, 20, 25, 26, 28, 29. Kansas, 4, 7, 13, 19 to 22, 28. Kentucky, 20, 30. Maryland, 5, 16, 19, 21. Massachusetts, 12, 13, 27, 30. Michigan, 7, 29. Minnesota, 5, 6, 18, 24. Mississippi, 18. Missouri, 5, 14, 15, 17, 18, 19, 27, 28, 29. Montana, 2, 4, 7, 15, 17, 19, 22, 28, 30, 31. Nebraska, 4, 7, 13, 14, 16, 17, 18, 25, 26, 28, 29. Nevada, 20, 31. New Hampshire, 13, 16. New Jersey, 13, 27. New Mexico, 10, 11, 13. New York, 13, 14, 22, 25. North Carolina, 19, 30, North Dakota, 4, 5, 6, 20, 26. Ohio, 15, 21. Oklahoma, 7.

Oregon, 5, 28. Pennsylvania, 8, 16, 20, 21, 25, 27. Rhode Island, 13, 14. South Dakota, 14, 17, 26, 27, 31. Texas, 4. Utah, 9, 10, 11, 29. Vermont, 13. Virginia, 9. West Virginia, 2, 27. Wisconsin, 7, 16, 17, 25, 26. Wyoming, 17, 19, 31. Sleet was not reported during July.

#### INLAND NAVIGATION.

The extreme and average stages of water in the rivers during the current month are given in Table VII, from which it will be seen that the only river that attained the danger line during the month was the Red River, which on the 29th and 30th was about 1 foot above the danger line at Shreveport, La. Among other rather near approaches to the danger line were the Willamette at Portland, Oreg., on the 8th and 9th, and the Big Sandy at Louisa, Ky., on the 26th.

#### SUNSHINE AND CLOUDINESS.

The sunshine is now recorded automatically at 15 regular stations of the Weather Bureau by its photographic, and at 28 by its thermal effects. The photographic record sheets show the apparent solar time, but the thermometric sheets show seventy-fifth meridian time. For convenience the results are all given in Table XI for each hour of mean local time. The cloudiness is determined by numerous personal observations at all stations during the daytime, and is given in the column of "average cloudiness" in Table I; its complement or clear sky is given in the last column of Table XI.

#### COMPARISON OF SUNSHINE AND CLEAR SKY.

The sunshine registers give the duration of direct sunshine whence the percentage of possible sunshine is derived; the observer's personal estimates give the percentage of area of clear sky. It should not be assumed that these numbers should agree, and for comparative purposes they have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observer's personal estimates of percentages of area of clear sky; the average excess for July, 1895, is 10 per cent for photographic records, and 15 per cent for thermometric records. The details are shown in the following table:

*Difference between instrumental and personal observations of sunshine for July, 1895.*

Photographic stations.	Instrumental.	Personal.	Difference.	Thermometric stations.	Instrumental.	Personal.	Difference.
Galveston, Tex.....	85	80	5	Chicago, Ill.....	83	63	19
Salt Lake City, Utah*..	76	54	22	Cincinnati, Ohio.....	80	54	26
Portland, Oreg. *.....	71	56	15	Salt Lake City, Utah.....	75	54	21
Helena, Mont.....	69	67	2	Portland, Me.....	74	35	39
Cleveland, Ohio.....	68	50	18	Key West, Fla.....	73	51	22
Santa Fe, N. Mex.....	68	48	20	Philadelphia, Pa.....	73	49	24
San Diego, Cal.....	67	69	- 2	Des Moines, Iowa.....	71	57	14
Dodge City, Kans.....	67	58	9	Vicksburg, Miss.....	71	68	3
Savannah, Ga.....	62	52	10	Washington, D. C.....	71	55	16
Bismarck, N. Dak.....	61	56	5	Atlanta, Ga.....	70	45	25
Denver, Colo.....	59	49	10	Marquette, Mich.....	70	45	25
Spokane, Wash.....	59	50	9	Baltimore, Md.....	69	57	12
Memphis, Tenn.....	56	40	16	Portland, Oreg. *.....	68	56	12
Kansas City, Mo.*.....	54	42	12	Rochester, N. Y.....	67	49	18
Eastport, Me.....	50	42	8	Columbus, Ohio.....	66	46	20
				Detroit, Mich.....	63	50	13
				New Haven, Conn.....	62	57	5
				New Orleans, La.....	62	62	0
				Louisville, Ky.....	61	46	15
				St. Louis, Mo.....	61	42	19
				Seattle, Wash.....	60	60	0
				Wilmington, N. C.....	60	60	0
				New York, N. Y.....	59	46	13
				Little Rock, Ark.....	58	44	14
				Norfolk, Va.....	57	49	8
				Boston, Mass.....	55	38	17
				Buffalo, N. Y.....	52	32	20
				San Francisco, Cal.....	49	51	- 2

\* Records kept by both methods.

+ All values for 16 days, except hourly percentages from 5 a. m. to noon, inclusive.